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Remarks

Rejections Pursuant to the Briody '552 Patent

The Examiner rejects pending claims 22, 24, and 49 under either 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,659,552 (Briody, 1972) or, in the alternative, as being obvious in view of the Briody '552 patent. The Applicants address both statutory provisions in turn.

§ 102(b) Rejection

Independent Claim 49 recites that the susceptor is "defined by a plurality of straight sidewall sections, each section having a planar surface, with said sidewall sections connected at adjacent sides."

Briody shows a round, one piece unit (Figure 4; Col. 4, lines 8-17) and a susceptor formed of rings (Figure No. 1), but Briody fails to show adjacent, sidewall sections with planar surfaces as claimed.

The Examiner disagreed with the Applicants' prior argument that Briody has curved sidewalls in a ringed drum configuration, as opposed to the Applicants' claimed planar sidewalls connected side to side. The Applicants respectfully point out that only the recessed pockets in the Briody '552 patent are described as flat. Briody is quite clear throughout the patent that the recessed portions have a flat backside, but that flat region has been carved out of a ringed susceptor with a rounded inner circumference. *See* Col. 1, Lines 49-50; Col. 2, Lines 47-50; Col. 3, Lines 22-23 and Figures 1-5. Those portions of the inner surface of the Briody susceptor other than the recessed pockets are, by definition, curved to form a ringed susceptor.

Briody also shows ringed portions of the susceptor separated by vertical spacers (Figure 1, Reference No. 21). The presence of Briody's spacers negates any planar sidewall construction as claimed. In a second embodiment, Briody describes the susceptor as a hollow drum with pockets therein (Col. 4, Lines 8-13). The hollow drum has no sidewall sections at all. Briody's lack of any disclosure related to the sidewall sections

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with planar surfaces, as claimed, prevents the Briody '552 patent from anticipating the Applicants independent Claim 49 under § 102(b).

Given that the Briody '552 patent does not show the planar sidewall sections, the Applicants respectfully state that the § 102(b) rejection is inappropriate and request the Examiner to remove the § 102(b) rejection from the pending claims.

§ 103 Rejection

In what is most likely a rejection under only § 103, the Examiner's most recent position (Office Action, Page 4) is

that the structure disclosed by Briody configured for a small number of bigger substrates would appear to have planar side walls sections attached at sides and different from rings separated by spacers.

The Briody disclosure does not support the Examiner's argument. All of the wafer receptacles in the Briody patent are of a size that allows Briody to maintain the round shape of the susceptor. *See, e.g.*, Briody col. 1, lines 51–52, stating “the recessed portions can be oriented circumferentially in one or more rows;” col. 2, line 45, describing the annular members; col. 3, line 1, stating that the induction coil is concentric with the graphite rings; col. 4, line 15, describing “equally circumferentially spaced pockets” (emphasis added throughout). The Briody disclosure is entirely silent in support for the Examiner's suggestion that a fewer number of bigger receptacles would be the equivalent of the claimed planar sidewall sections. In fact, if the Briody susceptor were modified so that the flat portions were so large that the susceptor had planar sides, the Briody susceptor would have no recesses at all and would not be functional.

The Applicants respectfully request the Examiner to consider the usefulness and non-obvious nature of the claimed susceptor. Having planar sidewall sections is useful in the claimed invention because the facing sections radiantly heat one another across an appropriately dimensioned space. Sidewalls having planar surfaces allow for direct alignment of the heating sections. In contrast, the curved surfaces of the susceptor

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disclosed in the Briody '552 patent would not provide the linear, more direct heat path from one wafer pocket to another that the claimed planar sidewall sections advantageously present.

Independent Claim 49 reinforces this direct heat path by reciting that "the spacing between facing sidewall sections is unobstructed and so dimensioned that said facing sidewall sections radiantly and directly heat the exposed surface of a facing substrate wafer to substantially the same temperature as said susceptor portion heats a substrate wafer that is in one of said wafer pockets to thereby minimize or substantially eliminate radial and axial temperature gradients across a substrate wafer."

The Briody '552 patent fails to suggest the recited spacing between sidewall sections enhancing an even temperature gradient. In fact, Briody uses "quartz members 40-40 . . . between the base member 12 and the rotatable support plate 14 to reflect heat toward the drum 16 so that the temperature gradient throughout the drum 16 stays relatively uniform." Col. 2, lines 72-75. These quartz members are the only means of adjusting the temperature gradient in the Briody patent.

The Applicants recite the planar sidewalls directly and radiantly heating facing wafers across an appropriately dimensioned space in the susceptor. The Applicant's original specification states that this claimed arrangement provides an even temperature gradient across the body of the susceptor, leading to improved wafer processing. Specification, page 5, line 18-page 6, line 2; page 12, lines 8-14. This improvement over prior susceptors would not have been obvious to one of skill in the art at the time of invention, particularly in light of the Briody '552 patent, which requires the quartz members (40) for the purpose of achieving an even temperature gradient.

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The Transitional Phrase "Consisting Essentially Of"

The Examiner's current position, as quoted above, ignores the fact that the Applicant's claim uses the transitional phrase "consisting essentially of" in reciting the system.

"Consisting essentially of" is a transition phrase commonly used to signal a partially open claim in a patent. Typically, "consisting essentially of" precedes a list of ingredients in a composition claim or a series of steps in a process claim. By using the term "consisting essentially of," the drafter signals that the invention necessarily includes the listed ingredients and is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention. A "consisting essentially of" claim occupies a middle ground between closed claims that are written in a "consisting of" format and fully open claims that are [**9] drafted in a "comprising" format.

PPG Industries v. Guardian Industries Corp., 156 F.3d 1351, 1354 (Fed. Cir. 1998), *rehearing denied*, 1998 U.S. App. LEXIS 30846 (Fed. Cir. 1998).

Accordingly, by reciting the invention as "consisting essentially of" listed components, an applicant defines an invention over prior art with additional steps or components that would materially change the characteristics of the applicant's invention. See MPEP § 2111.03.

The Applicants respectfully state that their original specification is quite clear that the chemical vapor deposition system recited in independent Claim 49 achieves a uniform temperature gradient by allowing facing planar sections of the susceptor to heat one another across a properly dimensioned space. Specification page 5, line 18—page 6, line 17; page 9, line 14—page 10, line 15.

The Applicants respectfully point out to the Examiner that the Briody '552 patent includes the quartz members (40) to change the temperature gradient across the susceptor. These quartz members would have a "material affect" on the Applicants' claimed susceptor because the quartz members would add more heat reflection to the bottom of the susceptor and across the wafers. This additional heat added to the Briody device would interfere with the Applicant's claimed susceptor achieving an even temperature gradient by properly spaced

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planar sidewall sections. Therefore, the invention recited in independent Claim 49 is patentable over the Briody '552 patent because the Applicant's invention is not "open to" having Briody's quartz members (40).

Accordingly, the Applicant respectfully requests the Examiner to remove the § 102 and § 103 rejections from the case at hand.

Rejections Pursuant to the Briody '552 Patent in view of the Martin '080 Patent

The Examiner rejects Claim 50 as being obvious pursuant to the Briody '552 patent in view of U.S. Patent No. 4,579,080 (Martin, 1986). The Applicants respectfully assert that the independent Claim 49 is allowable as discussed above. Dependent Claim 50 is likewise allowable upon these arguments.

Additionally, the Applicants respectfully assert that the Briody '552 patent and the Martin '080 patent cannot be successfully combined because one disclosure teaches against the other. The Martin '080 patent intentionally includes areas of

substantially reduced thickness at prearranged locations relative to wafer positions on the susceptor to induce greater induced heating at such prearranged locations and thereby to alter the temperature of the susceptor at such regions. These regions of substantially reduced thickness are positioned at locations on the susceptor which produce substantially uniform temperature profile across the susceptor at predefined wafer positions.

Martin, col. 4, lines 55–64. The Briody '552 patent, on the other hand, fails to give any indication that these thinned regions in Martin's susceptor would actually work in the Briody device.

Additionally, the Martin '080 patent (col. 10, lines 30–35) states that its wafer receptacles are "slightly concave so that a central region of a bowed wafer will not contact the susceptor." In direct contrast, the Briody specification (col. 1, lines 64–66) states its device centrifugally forces the articles against the susceptor surface. The Briody and Martin devices have different operating parameters that cannot be reconciled.

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Without some motivation for combining the two disclosures, the Applicants respectfully request that the claimed combination of references be removed from Claim 50.

Conclusion

The Applicants submit that the amended claims are in the appropriate condition for immediate allowance and respectfully request the same. No fee is due for this submission. If the Office determines that a fee is due, the Examiner is authorized to charge any fees or credit any prior over payments to Deposit Account No. 50-0332.

Respectfully submitted,



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